

**Marine Technology and Aquaculture Center (MTAC)
Feasibility Analysis**

Kevin Hively, Ninigret Partners, LLC (May, 2003)

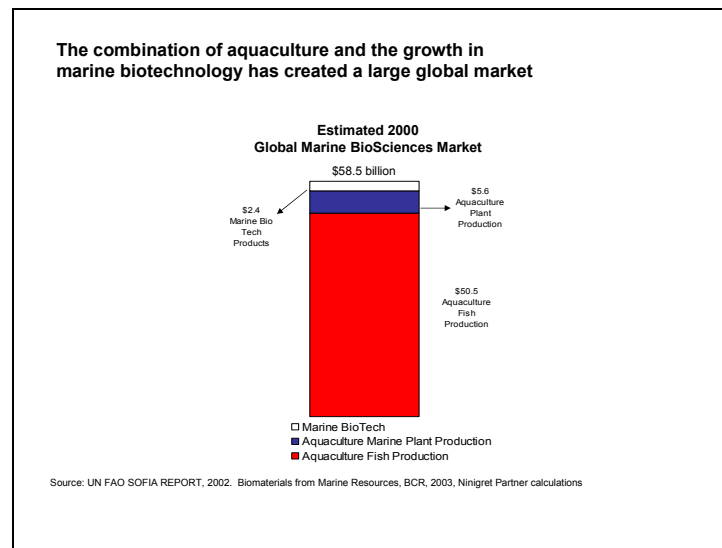
MTAC Feasibility Analysis

- I. Overview of the Marine Biosciences Industry**
- II. MTAC Concept**
- III. Financial Requirements**
- IV. Recommendations**

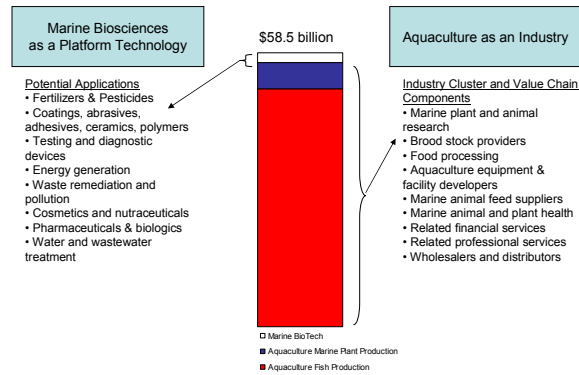
I. Overview of the Marine Biosciences Industry

a. Market Size

b. Market Trends

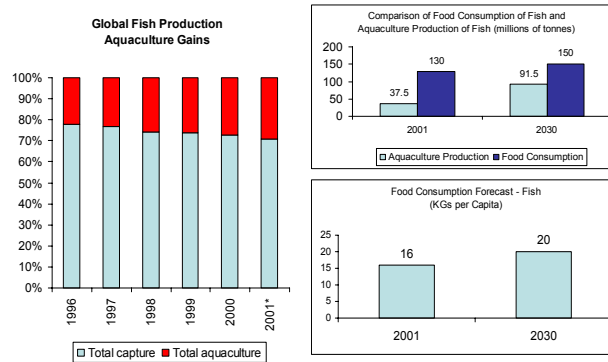


Supporting industries and applications in large end user markets suggests that marine biotechnology has a significant upside



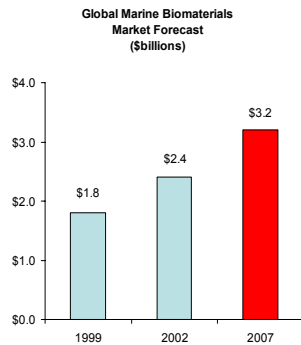
Source: UN FAO SOFIA REPORT, 2002. Biomaterials from Marine Resources, Business Communications Research, 2003, Ninigret Partners calculations

Fish produced through aquaculture are gaining an increasing share of the overall market and is forecasted to continue to add share over the next several years



Source: State of the Worlds Fisheries and Aquaculture, UN FAO, 2002

The use of marine biosciences as a platform technology is expected to show continued significant gains over the next several years



Examples of Specific Applications

- Coatings based on shellfish-derived compounds with potential use in the automotive and aerospace industries
- Compounds (biopolymers) derived from shrimp and crab that increase the yield and reduce the waste of textile manufacturers during the dyeing and pigmentation stage
 - These same compounds, chitosans, have multiple applications in wide range of industries
- Extracts from certain sea coral are used in skin creams
- Compounds from marine sponges and other invertebrates are used in pharmaceutical products
 - Bryostatin, Cyclomarin A, Debromohymenialdisine, Didemnin B, Discodermolide, Eleutherobin, Manoalide

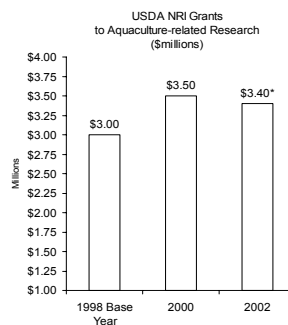
In support of marine and aquaculture research, federally-funded projects have appeared across several agencies

Agencies have provided funds for facilities, fellowships and research...

Federal Agencies with Funding for Marine BioSciences and Aquaculture Research

- NOAA
- Economic Development Administration
- National Institutes of Health
- National Science Foundation
- Department of Energy
- DOD Office of Naval Research
- US Department of Agriculture

...With some evidence that research funds have been increasing



* Note: not all FY 2002 funds were awarded as of publication of the information

II. MTAC Concept

- a. Market Research Findings**
- b. Rationale for MTAC**
- c. Marketing Strategy**
- d. Competitive Position**

Market research reveals potential MTAC interest and underlying demand for marine bioscience research space.

Findings

- Along the eastern seaboard of the US there are extensive marine laboratory facilities, however:
 - Research activities within the institutions absorb most of the space
 - Renting the space is expensive
 - Rather than leasing space, most of these facilities conduct contract research
- Within the immediate area (60 mile radius) there are several substantial infrastructure limits to marine bioresearch
 - Lack of access to facilities with available freshwater and sea water
 - Lack of scaleable facilities to conduct experiments with large groups of fin fish or shellfish
 - Lack of appropriate containment facilities to test vaccines and other aquatic animal health
 - Lack of large enough facilities to conduct population-based genetic studies
 - Limited access to proteomics equipment and other genetic diagnostic tools

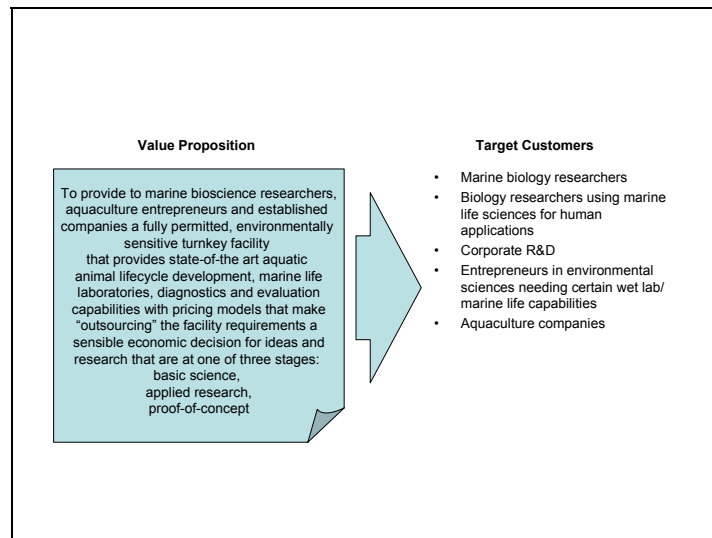
Sample Market Place Comments

- Rhode Island currently lacks laboratory space, other facilities and support services in marine and environmental technology... *Slater Center for Marine and Environmental Biotechnologies*
- We need to go to Canada to get adequate marine biologics holding facilities for our research ... it limits the types of research you can do and the competitiveness of your grant applications ... *Research Leader, Marine Biological Laboratory*
- Turnkey aquaculture space, permitted and built-out, is at a premium ... *Harbor Branch Oceanographic*
- Vacant built-out biotech lab space in the Boston market: 300,418 sq ft or 3.6% vacancy rate through January '03... *Oncor International Real Estate Market Analysis*

A facility-based approach makes the most sense

- Marine biosciences has unique facility requirements (grow-out capabilities, animal holding facilities, secure testing facilities, running seawater) which may make company development problematic
 - A facility increases the chances of success (and conserves much needed cash) of existing Slater Center investments by providing built-out facilities, permitted water management and access to lab facilities and equipment
- While a facility is not “risk-free” it does have a different risk profile than a company investment
 - Rather than a bet on a specific company, a facility is a bet on a specific applied science area
 - RI has had demonstrated success with a facility-type approach albeit not intentionally
 - The initial investment was on the company but the facilities have continued to be recycled
 - Alpha Beta (Dow Life Sciences), CytoTherapeutics (several companies in their old facilities in Providence and Lincoln), Welgen (now Amgen)
 - A properly designed facility will also have the capabilities of serving the research community

The Marine Technology and Aquaculture Center (MTAC) concept is targeted to provide ease of access and use for companies and scientists in need of specialized facilities for marine biology



Market Opportunity with Targeted Customer Base

Marine BioSciences R&D

- \$100 million - \$200 million in R&D expenditures involving marine biosciences between the US and Europe
 - Marine biology researchers: US only (\$37 million – over \$60 million)
 - Office of Naval Research has an entire group now focused on marine materials and marine biotechnology
 - The EU Commission has approximately \$15 million in aqua R&D
 - Country specific funds are unknown but could be substantial
 - Global aquaculture corporate R&D: \$35-\$50 million in corporate funded aquaculture R&D activities
 - Feeds, animal growth acceleration, weight gain, new species
 - Unknown expenditures related to marine biomaterials research in corporate R&D
- Rhode Island is already a participant in some of this activity through research occurring at URI, Brown and Women and Infants Hospital

Aquaculture Company Development

- Harbor Branch noticed increase interest in foreign aquaculture companies in US facilities
- Specific to Rhode Island
 - Since 2000 Rhode Island has added 6 new permitted aquaculture facilities on a year 2000 base of 12
 - Slater Center for Marine and Environmental Technologies suggests 1-2 prospects per year would need this type of facility

To reach these target customers and convert prospects into tenants a multi-channel strategy will be employed

Channel	Approach
<i>Direct Marketing and Selling to Key Researchers & the R&D Groups of Appropriate Companies</i>	<ul style="list-style-type: none">▪ Focus on researchers and companies engaged in relevant research and development where marine biologic lifecycle capabilities are required in a large scale facility
<i>University and Lab Research Administration Offices</i>	<ul style="list-style-type: none">▪ Provide materials and information to the RA offices for institutions engaged in marine biosciences about the facility▪ Position the facility as a research asset utilization tool to save institutional capacity for research grants that may offer better indirect cost recovery
<i>University Technology Licensing Arms and State Technology Development Centers</i>	<ul style="list-style-type: none">▪ Provide materials and information to the tech transfer offices to gain access at the licensing stage of commercialization / company launch stage
<i>Relevant Venture Capitalists and Financial Groups</i>	<ul style="list-style-type: none">▪ Provide materials and information to VCs and other financial and potentially strategic investors as a cash preservation tool during the proof-of-concept, early production states for venture-type investments

A Mix of Facility Solutions will be Offered to Prospective Tenants

Base Facility

- Main Building ~ 8000 sq ft of office and lab space designed to maximize use
 - Approximately 2000 sq ft will be fixed with conference rooms, kitchen space, reception area and center staff office space
 - 6000 sq ft will be designed for use as office space or a wet/dry lab configurations
 - It is anticipated that approximately 60% of this space will be lab and 40% will be office
 - These facilities will be structured as suites but designed for ease of reconfiguration with new tenant requirements
- Greenhouses
 - Initial construction will have four greenhouses of 1800 sq ft each capable of serving as hatcheries and grow-out for a variety of fin and shellfish

Capabilities

- Fully permitted facility
- Running freshwater and seawater in a recirculating system
- Waterfront access
- Laboratory and office space
- Access to business support services

The Facility as Conceptualized will have a Unique Niche in the Marketplace

- The concept as outlined is unique in its approach to marine biotechnology research and company incubation
- However, a facility with combined incubation and research space is not unique.
 - Several examples across the country
 - Most of these have an educational institution as anchor tenant
 - Within Rhode Island, the Center for Design and Business has incubation space for start ups and space for companies working with RISD on product design issues

With its running seawater capability, this facility will provide a unique position in the marketplace versus most bioscience incubators and commercial lab space

MTAC will face competition from different types of facilities

- New aquaculture/marine bioscience parks
- Excess capacity in educational facilities
- Other BioScience incubators
- Commercially available lab space

Competitive mix overview	
Competitor	Comments
<i>Aquaculture/Marine BioScience Parks</i>	<ul style="list-style-type: none"> ▪ We are aware of only one facility being planned in Virginia ▪ Maine and North Carolina have aquaculture "incubators" but do not have the facility combination proposed for MTAC <ul style="list-style-type: none"> ▪ USDA facility in Maine will be built next to the Aquaculture facility ▪ Canada is developing facilities along its Atlantic coast near Halifax
<i>Excess Capacity in Educational Institutions</i>	<ul style="list-style-type: none"> ▪ Along the US eastern sea board and the maritime provinces of Canada ---- sq ft of marine biology lab space is being built or renovated in the next three years <ul style="list-style-type: none"> ▪ Notable local examples include UNH ▪ MBL is undergoing a strategic plan that includes a master plan to add significantly to its research space <ul style="list-style-type: none"> ▪ this excludes holding facilities or capabilities for "large" population-based experiments ▪ Some facilities do lease lab space or perform "collaborative research"

Competitive mix overview	
Competitor	Commentary
<i>BioScience Incubator</i>	<ul style="list-style-type: none"> ▪ Several existing incubators exist in New Haven and Worcester ▪ Plan for two incubators in New Hampshire <ul style="list-style-type: none"> ▪ one on the Eastern Shore, one at Dartmouth ▪ None have marine bioscience capability (seawater) ▪ Slater Center for Biotechnology recently purchased equipment and has entered into a lease for space in the former Cell-Based Delivery facilities to serve as an incubator
<i>Commercially Available Lab Space</i>	<ul style="list-style-type: none"> ▪ Vacancy rates are increasing in biotech office space although built out lab space appears to still be in demand <ul style="list-style-type: none"> ▪ Supply in the Providence market is very tight ▪ There is no evidence of any seawater capability in any of these facilities

III. Financial Requirements

- a. Revenue Model**
- b. Income Statement**
- c. Capital Requirements**
- d. Capital Sources**

MTAC will use Multiple Methods to Generate Revenues

Revenue Streams

- Leases for facility space
 - Marine biology researchers
 - Start up companies
 - Existing companies with specific requirements
- Royalty payments
 - In lieu of full rental costs for start ups
- Facility rentals (short-term 90 days or less)
 - Conference rooms
 - Tanks
 - Laboratories

Comments

- It is recommended that serious consideration be given to landing an anchor tenant to provide some financial stability to the center
- It is recommended that equity be considered as a last resort and with significant safeguards

A quick sample of marine labs and commercially available lab space in the region provides some guidance on potential price points for the facility

Marine Lab Space (sample set)	Relative Sq ft Costs	Comments
U Southern California	\$168	Actual lease is \$20 per day for 110 ft. unit
Duke	\$42	Actual lease terms are \$3.50 sq ft per month
MBL	\$148	Most leases when space is available are summer only
U South Carolina	\$24	Actual lease for sea water lab is \$2.00 sq ft per month
Commercial Biotech Lab Space		
Providence	\$25-\$35	Commercial lab space is very limited although the liquidation of CBD will add fully built-out space to the market
Boston/Cambridge	\$45-\$65	Subleases are available in the \$35 range
Rt. 128	\$30-\$35	Little actual space is in this location

MTAC will likely Require an Operating Subsidy or Commitment from an Anchor Tenant

		Year 1	Year 2	Year 3	Year 4	Year 5
Income						
Rental Fees						
	Office	\$5,760	\$13,843	\$16,295	\$18,882	\$20,529
	Lab	\$12,960	\$28,922	\$34,373	\$42,485	\$46,191
	Greenhouse Space					
Usage Fees	\$	23,880	\$ 54,989	\$ 64,030	\$ 74,895	\$ 80,270
Admin Service Use Fees	\$	648	\$ 1,512	\$ 1,728	\$ 1,944	\$ 2,052
University Partner Lease Fees						
Total Income		\$43,248.00	\$99,266.60	\$116,426.66	\$138,206.27	\$149,042.26
Expenses						
Personnel (fully loaded costs)	\$	268,750	\$ 279,500	\$ 290,680	\$ 302,307	\$ 314,399
	Center Director	\$ 121,500	\$ 126,360	\$ 131,414	\$ 136,671	\$ 142,138
	Maintenance Support	\$ 113,500	\$ 118,040	\$ 122,762	\$ 127,672	\$ 132,779
	Office Support	\$ 33,750	\$ 35,100	\$ 36,504	\$ 37,964	\$ 39,483
Operating Expenses						
Marketing costs	\$	10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
Utilities						
	Telephone	\$ 39,000	\$ 40,170	\$ 41,375	\$ 42,616	\$ 43,895
	Electricity	\$ 12,180	\$ 26,870	\$ 30,930	\$ 36,540	\$ 38,570
	Water					
Purchased Services (payroll)	\$	1,000	\$ 1,030	\$ 1,061	\$ 1,093	\$ 1,126
Tenant Costs (build outs, etc.)	\$	5,000	\$ 5,150	\$ 5,305	\$ 5,464	\$ 5,628
Office Supplies & Postage	\$	5,000	\$ 5,150	\$ 5,305	\$ 5,464	\$ 5,628
Insurance	\$	10,000	\$ 10,300	\$ 10,609	\$ 10,927	\$ 11,255
Janitorial	\$	6,000	\$ 6,180	\$ 6,365	\$ 6,556	\$ 6,753
Security Costs	\$	4,800	\$ 4,944	\$ 5,092	\$ 5,245	\$ 5,402
Professional Fees	\$	5,000	\$ 5,150	\$ 5,305	\$ 5,464	\$ 5,628
Miscellaneous (T&E, contingencies)	\$	10,000	\$ 10,300	\$ 10,609	\$ 10,927	\$ 11,255
Office Equipment	\$	12,000	\$ 6,000	\$ 6,180	\$ 6,365	\$ 6,556
Total Expenses	\$	388,730	\$ 410,744	\$ 428,815	\$ 448,969	\$ 466,095
Operating Profit/Loss		(\$345,482)	(\$311,477)	(\$312,389)	(\$310,762)	(\$317,052)

Financial Model Assumptions

- Rental rents
 - Assumes \$30 sq ft for lab space (midpoint range of leasable built-out biotech lab space in Providence)
 - Source: email exchanges with 2 biotech executives in Providence
 - Assumes \$12 sq ft for office space (midpoint cost of office space in Providence jewelry district)
 - Source: lease rates for small scale office space in “minor” buildings per Ninigret Partners
- Assumes recovery of costs for electricity and telephone through usage fees without markups
- Space absorption rates based on national experience of incubators
 - Source: National Business Incubator Association
- Operating expenses modeled on three incubators
 - Urban Ventures incubator in Providence, RI (non profit)
 - NH Biotechnology Incubator (proposed) at Dartmouth College (non profit)
 - Cambridge Innovations Incubator in Cambridge, MA (for profit)
- Energy and water costs
 - Energy costs based on Marine engineering estimates
 - Lab energy costs based on EPA Labs21 benchmarking Northeastern labs midpoint

At least \$2.9 million will be needed for construction assuming no expenditures are required for land acquisition

Capital Requirements

<i>Facility Construction</i>	\$	2,887,360	
Land costs			
Building construction	\$	1,092,000	includes HVAC costs for lab facilities
Greenhouse construction	\$	120,000	
Water system construction	\$	1,230,000	
A/E design	\$	150,000	
Construction management	\$	48,840	
Permitting and associated costs	\$	122,100	
% for the arts if state built	\$	24,420	

Build out

Scientific equipment			
Back up power costs	\$	100,000	generator and clean power

Several Potential Sources of Capital Exist

Sources of Capital

- Federal Sources
 - Direct appropriation
 - Grant programs
 - Department of Commerce
 - Economic Development Administration (EDA)
 - National Oceanic and Atmospheric Administration (NOAA)
 - US Department of Agriculture (USDA)
 - Health and Human Services (HHS)
 - National Institutes of Health (NIH)
 - Resource Center Grants
- Private Capital
 - Charitable Funds
 - For profit investors
 - REITs
 - HCP has invested in laboratory facilities

Examples of Other Facilities

- New Hampshire Biotech Incubator
 - \$2.6 million federal grant through EDA
 - \$1.2 million from NH govt.
 - \$700k Dartmouth College (land donation)
 - \$500k private sector (target)
- Harbor Branch Aquaculture Park
 - USDA funded joint research center
- Bryant/RISD Center for Business and Design
 - Secured corporate support from several local companies

IV. Recommendations

Strategic

- Position MTAC as a marine research and development facility with business incubation capabilities rather than a straight business incubator
 - Opens up market opportunities for academic marine researchers looking for space
 - Corporate R&D
- Consider an academic/research institution as the anchor tenant, possibly more than one
 - Creates stability with the cash flows of MTAC
 - Provides for the possibility of securing resource grants through NOAA, NMFS, USDA or NIH
 - Set up properly creates indirect cost recovery potential
- Consider whether the facility (building) is too small
 - Particularly if approach is to go for federal appropriation
 - Greenhouses can be added later due to modular format

Operational

- Consider structuring MTAC leases on a “suite” basis rather per sq ft. to avoid inappropriate price comparisons
- Leverage existing center director rather than adding the cost of a new “director”
- If incubation capability is still desirable have access to these services rather than built in to the cost structure of MTAC